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THE EFFECT OF EXPERIMENTALLY INDUCED STEREOTYPES ON THE METACOGNITION ACCURACY AND COGNITIVE PERFORMANCE OF ELDERLY PARTICIPANTS WITH INTERNAL LOCUS OF CONTROL

BY

JENNIFER RODGERS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

IN FAMILY STUDIES

FACULTY OF HOME ECONOMICS

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N. L. Stuart
Supervisor

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D. G. Jerry

Date: August 31, 1983

Dedication

To Dad, whose love for learning has always served as an inspiration.

To Mom, whose sense of humor and contagious laughter encouraged me through the rough spots.

Abstract

The effect of positive and negative feedback on metacognition skills and actual cognitive performance of 20 elderly internal, 20 young internal and 20 young external subjects is examined in the following paper. It was hypothesized that, despite their internal locus of control orientation, the pervasive negative stereotypes concerning the memory and learning of the elderly lowers their expectations of success or failure in cognitive performance. For this reason their metacognition scores and cognitive scores would be influenced by the experimenter's feedback in the same way most young externals are influenced. Younger internals, on the other hand, would be generally resistive to manipulation.

All subjects completed Rotter's Locus of Control Scale, three metacognition tests and a series of comprehension tests. An analysis on the entire sample using a 2x3 Anova with the two dependent variables revealed no significant effects for age, locus of control or feedback. However, in a post hoc analysis, ten elderly internals were matched with ten young internals on their locus of control score and compared to ten young,

extremely high scoring externals. Then a significant interaction was found which offers support for a modified hypothesis.

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Chapter 1

Introduction

In our society there is wide acceptance of negative stereotypes about old age. Western society idealizes youth by attributing positive characteristics such as beauty, independence, activity and hardiness to the young while regarding old age as promising little satisfaction (Kahana, 1977). Rather than recognizing the resource of knowledge and experience that our aged members offer, we tend to view them as a burden and a drain on our resources (Detzner, 1980).

These negative stereotypes may apply to a portion of the aged population but society should recognize that the elderly make up a highly divergent group of individuals. The negative stereotypes are inapplicable for the clear majority who are healthy and functional (McKenzie, 1980). In recent years, acknowledgment of the advantages of aging to both the individual and society have begun to emerge (Palmore, 1979). For example older persons are more law abiding and contrary to popular opinion, persons over 65 have substantially lower victimization rates in nearly all categories of personal crime (U.S. Dept. of Justice,

1977). They also have freedom from the demanding responsibilities of childbearing and job-related roles. Furthermore, many older people have positive concepts of themselves, desire continuous growth and are eager to find fulfillment through participation in broader, more meaningful social roles (Tibbets, 1980). Such expectations should not be considered unrealistic. Today's elderly members are increasingly better educated, healthier and living longer (Morgan, 1979). The advantages of growing old, however, do not at present outweigh the disadvantages. What advantage is freedom from childrearing responsibilities and work if these roles are not replaced with new roles that are viewed as important by society and the individual? For the most part, elderly members are placed in a subordinate social position. The negatively viewed roles of the elderly are a product of the stereotypes that society believes about the aging process. Senility, intellectual decline and unproductivity are a few of the characteristics associated with old age. In this paper the effect of some of these negative stereotypes about the elderly will be studied.

Some theories (e.g., social labeling theories and various role-related theories) suggest that attitudes and stereotypes influence how one feels about oneself, which in turn, influence one's behavior (Shaw & Costanzo, 1982).

For example, if society labels elderly individuals as incompetent solely on the basis of chronological age or wrinkles and grey hair, any sign of poor performance will reinforce the aged person's acceptance of the stereotype as fact and perhaps lead to a self-fulfilling prophecy. A change in attitudes from a negative to a more realistic view of the aged, may positively influence the elderly's view of themselves and their behavior. In turn, the quality of life for the growing number of aging adults in our society may improve, allowing their potential as a valuable resource to be further realized.

Unfortunately, attitudinal change is slow and resistant. Ageism is a longstanding cultural phenomenon in Western society (Levin & Levin, 1980). The fact that the negative concepts and values about old age have become institutionalized (i.e., forced retirement) and are accepted as norms, makes any change in attitude a formidable task (Palmor & Manton, 1973). Two other factors continue to reinforce, rather than negate, existing beliefs: (a) those who dread getting old and fear death itself, project their feelings against the elderly and (b) our extended life expectancy and the growing numbers of aged members does increase the prevalence of old adults who manifest some of the characteristics supporting the negative stereotypes

(Tibbetts, 1980).

For these reasons we cannot invalidate the powerful effects that negative stereotypes may have on aging individuals. Negative labeling and stigmatization of the elderly remain widespread and summarize cultural expectations. The inherent danger exists that such labels and cultural expectations contribute to behavior that actually confirms the stereotypes (Rodin & Langer, 1980).

Many of these negative stereotypes about the aged make a statement about their level of competence, or lack of it. The aged are often considered unproductive, uncreative, fatalistic, conservative and senile (McKenzie, 1980). Competence can be viewed from a number of perspectives: social role performance, ability to cope, feelings of mastery, internal control (Kuypers & Bengtson, 1973) and cognitive performance (Smith, 1980). Although the various aspects of competence are interrelated, one of the most widely accepted stereotypes about aging is the belief that mental ability declines universally and irreversibly.

One cannot deny the importance attached to cognitive abilities in life. Daily routines and the challenge of new situations require competence in the skills of

encoding, storing and retrieving information (Smith, 1980). Few middle-aged adults have difficulty performing basic cognitive tasks encountered in daily life but there is much debate whether or not these processes remain efficient as one ages. Researchers (Horn & Donaldson, 1976; Baltes & Schaie, 1976) and aging individuals seem equivocal about a person's cognitive abilities in later life. Increasing evidence suggests that much of the anticipated decline in later years may be environmentally induced rather than biological (Labouvie-Vief, 1976). Why then do so many people uncritically accept the stereotype that mental abilities decline as we age?

For one, older individuals often complain of memory problems in their daily routine (Perlmutter, 1978). Many anticipate and accept reduced competency as a part of the natural process of growing old (Kuypers & Bengtson, 1973). Although memory problems appear to be a fact of old age they begin to appear much earlier than most of us are willing to admit (Permutter, 1978). For instance, memory demands increase fairly early in adulthood and continue throughout life. Such an overload may cause interference with one's memory/learning skills even for the young adult. However, as one ages there seems to be an increased sensitivity, awareness and disturbance about such problems which may be no more severe than for young

adults. Due to prevailing cultural expectations that memory/learning capabilities decline with age, older people seem more likely than the young to concede that failures indicate biological, irreversible problems (Zelinski, Gilewski & Thompson, 1980) when in fact other factors, such as increased demands, may account for memory failure.

Society's belief that cognitive abilities decline with age is also supported by research. Early theories about the effect of aging on cognitive abilities and the resulting cross-sectional research, describe the elderly person's cognitive abilities in terms of irreversible decrement (Jones, 1956; Botwinick, 1967; Horn, 1970). Other early cross-sectional research on intelligence also supports the conclusion of irreversible decrement as one ages (Miles & Miles, 1932; Jones & Conrad, 1933; Doppelt & Wallace, 1955). Such cross-sectional data only reveals age differences on many measures of memory/learning and not age change. Age differences may be due to a number of possible causes, but too often, when results are evaluated, distinctions are not made between biological and environmental influences which affect performance (Arenberg, 1977). Baltes & Schaie (1976) theoretically showed that people who differ by age frequently differ by other characteristics such as life experiences and

generational differences. Societal influences such as war, economic depression and trends in education have been offered as possible explanations why various age groups perform differently (Papalia & Olds, 1978). As well the type of test used in experimental research plays an important part in the results. Ecologically valid tests, based on experiential learning rather than tests based on speed, for example, are less biased against the elderly (Labouvie-Vief, 1976). In spite of these more recent findings, the assumption is still frequently made that differences between age groups have been caused by physiological age change.

The apparent discrepancies of cross-sectional studies and the findings from longitudinal studies support a new theory. It is one of decrement with compensation (Nesselroade & Reese, 1973). The theory assumes that maturational events require phases of growth and decline. During the decrement phase biologically determined decrement may be partially compensated by environmental input. For many psychological variables where performance seems significantly dominated by periferal sensory functions and psychomotor speed, the elderly person may be at a disadvantage compared to the young (Schaie, 1973). However, accumulated past experiences enriching one's data base of acquired knowledge permits older adults to perform

some learning tasks more competently than younger adults (Perlmutter, 1980).

Factors such as generational differences, methodological biases, inappropriate research questions and techniques, interfere with our ability to access true deficits in memory/learning due to one's biological old age (Labouvie-Vief, 1976). However, conclusions are still made which ignore the fact that there are environmental concomitants and tremendous individual variability among older people. Some elderly show sharp decline in their memory/learning skills, some have improved their skills through intervention programs and others show considerable stability (Ward, 1979). Moreover, within any one individual, different functional capacities change at different rates with age. Changes of capacity that limit performance of one task may not do so for another task (Welford, 1980).

How global and important a problem is it that society generally accepts the negative stereotypes of cognitive decline? Are all negative stereotypes about the elderly equally as powerful or are negative cognitive stereotypes more pervasive? How do the elderly who generally view the aging process positively, despite cultural stereotypes, evaluate their memory/learning skills? For example, if

they are happy with their lives, actively involved socially, flexible and sensitive in their interactions with others and generally adapting well to old age, do they still believe they are cognitively deficient compared to their abilities in former years and in comparison to members of their own cohort, as well as, younger individuals today? More importantly, do they let their performance decline because they are told that it will? Do such attitudes become self-fulfilling prophecies?

It is unlikely that we will find age decrement in memory/learning skills to be entirely a myth but there is increasing evidence that changes in memory/learning during late adulthood does not constitute irreversible, universal, biological regression (Labouvie-Vief, 1976; Baltes & Schaie 1976; Hurlbut, 1977). Rather than emphasizing biological factors as the primary basis for explanation, research must further explore the environmental factors. It is possible that negative stereotypes have a powerful effect on the elderly's assessement of their cognitive abilities. In turn, actual performance may deteriorate due to self-fulfilling expectations of decline. The following study was designed to investigate the influences of stereotypes on the elderly's expectations of success or failure in cognition performance.

Chapter II

A Conceptual Framework

The effects of negative attitudes and stereotypes about old age can be partially explained in terms of our socialization process. According to role theory, social behavior and the feelings we have about ourselves and others are influenced by what we learn through our social interactions. The learning process involves observing the behavior of others for the purpose of evaluating our own. For example, individuals learn the expected role behavior of mother, sister or grandmother through the social interaction that takes place in the family or with significant others. Each role involves expected norms and differs in expectations of behavior for different age groups.

Role theory is an orientation to the study of social behavior that emphasizes the importance of roles, status and the socialization process that shapes our values and expectations. The basic concepts of role theory are presented, followed by a discussion of how they relate to the elderly. The Social Breakdown Syndrome Model, a social labeling theory by Kuypers & Bengston (1973) is

used to illustrate the dynamics of role theory which are involved in the negative evaluations of elderly individuals. In addition, the concept of locus of control is introduced as a personality characteristic which may play an important part in how individuals evaluate themselves and their roles, as well as how they are affected by the socialization process in later life.

Principles of Role Theory

Society has rules, spoken and unspoken, which tell us how to organize and structure our behavior if we want to receive society's approval. The rules are dependent upon such things as one's age and one's socio-economic status. Although there is some latitude in what behaviors are considered acceptable for various age groups and for particular social positions, the limitations are clearly defined (Biddle, 1979). The learning and continuation of these rules are explained in terms of the principles of role theory. The rules determining one's behavior are influenced by roles, role expectations, role skills, the reference groups with whom we socially interact and the socialization process which explains how one learns the rules.

Every individual plays a role (or set of roles) in society. Role refers to a pattern of specific rights and

duties (Foner & Schwab, 1981) and, as well, it implies a degree of importance or function. Included in the concept of role is a set of prescriptions which dictates how a member in any particular social position is expected to behave. Status, which is concomitant with the concept of role, refers to the position an individual occupies in society. There is no role without status or status without role; the one (role) is functional, the other (status) is structural (Roscow, 1976). Thus, based on their role, different behaviors are deemed appropriate for doctors, students, law enforcers or grandparents, and associated with these roles is a status or a certain position in the hierarchy of cultural roles. Doctors have more status than students or grandparents.

Throughout our lives roles change. Old roles are relinquished or redefined; new ones are acquired. Some are acknowledged by particular rites of passage unique to the society in which one lives (Blau, 1973); others are slipped into unceremoniously. The process of socialization, that is, the process by which we learn the norms of society and acquire our own distinctive values, beliefs and personality characteristics, teaches us when to leave one role for a new one and what the characteristics of the new role entail.

Socially defined rules or standards of behavior are called norms (Biddle, 1979). Norms describe the limits of appropriate behavior for a particular role. Many norms do not have the force of statutory law but, none the less, are rarely challenged. Norms proscribe and prescribe behavioral expectations which are the oughts and shoulds of a given role. People share these expectations for their own behavior and that of others. In the course of socialization, these expectations become covertly held norms upon which to evaluate one's own behavior (Shaw & Costanzo, 1980). For instance, although the role of grandparents may be somewhat vague, its norms include providing emotional gratification or nurturence to grandchildren without interfering with the childraising decisions of the parents (Robertson, 1976).

Role evaluation is society's expression of approval or disapproval toward role behavior (Biddle, 1979). It involves making positive or negative judgments about a particular role behavior or expectation. Society, then, sanctions certain role behaviors in line with these role evaluations. Sanctions attempt to maintain positively evaluated role behaviors and change negatively evaluated ones. Through sanctions, society maintains appropriate role behavior and continues to socialize individuals into new age-related roles (Shaw & Costanzo, 1980). For

instance, Atchley (1976) suggests that being a retired person is a definite role in American society with societal norms of behavior which dictate the kind of behavior to expect from retired people. The norms include the responsibility to manage their personal lives without assistance and to make appropriate lifestyle decisions. These norms are positively sanctioned by giving rights to retirees which include economic support without a job or without negative sanctions and autonomous management of personal time.

Once the individual is socialized into accepting the roles with their concomitant norms they become a part of the individual's self-concept. With the internal acceptance of "other based" norms, the individual accepts his/her role and forms a system of values which agrees with societal norms by which they regulate his/her own behavior (Biddle, 1979). Most older people have a way of acting "old" by playing a role they have learned from society. Age-related behaviors are clearly defined. Those who defy them are told to act their age. In other words, elderly people are told to accept the stereotypic definition of being old and to behave accordingly (Montegue, 1977).

Role Theory in Respect to the Elderly

The functional element in the role of an elderly individual is somewhat vague. In fact, the predominant aspect of socialization for this age group is the loss of significant roles given priority earlier in adulthood. This is particularly problematic because it is not usually followed by entry into new roles which are socially valued (Blau, 1973). For instance, individuals are generally forced to retire from the work force at age 65, parenting roles are relinquished even earlier and the role of husband or wife may end with the death of one's spouse. Even though there are no significant replacement roles to effectively structure an elderly person's activities, societal role expectations and sanctions suggest that they must give up previous roles and simply accept the role of an "old" person. The exit signs are there but due to the lack of clear role definitions, no clear pathway back to social reincorporation is provided. Role losses are a cue to many that they are old. The label in itself and the norms and role expectations that the label engenders have powerful effects on how the elderly are told to act and how others treat them. Significant role loss intensifies the negative aspects of becoming old and underscores the fact that the social consequences of one's role in later life is relatively insignificant (Roscow, 1973).

Unlike the vague functional role of old age,

society's behavioral expectations and norms for the elderly are quite clear. Asexuality, intellectual rigidity, unproductivity, ineffectiveness and disengagement are all encouraged (Levin & Levin, 1980). Furthermore, the possibility of maintaining middle-age roles for any length of time is unlikely. In most areas, societal sanctions prevent the elderly from maintaining previous roles (i.e. forced retirement). Physical characteristics such as wrinkles, grey hair and stooping shoulders clearly distinguish aged individuals and make it difficult for them to be deceptive about their age. Consequently, in later years, the unnegotiable exit from occupational and parenting roles, as well as aging physical characteristics, cause individuals to concede to society's socialization pressure and to relinquish their middle-age identification. They inevitably enter the role of senior citizen, a role in which society places little value (Levin & Levin, 1980) and which has low status.

Once individuals take on the role of being old they generally accept society's role evaluation. These rules become a part of their belief system by which they can evaluate their own self-worth. Negative stereotypes which suggest that the elderly are incompetent and obsolete may play an important part in how the individuals view themselves.

The Social Breakdown Syndrome Model (Kuypers & Bengston, 1973) suggests that a general breakdown in self esteem by aging individuals begins with a breakdown of social interactions. This involves the loss of significant roles such as those which are relinquished due to retirement or widowhood. As well, the lack of clearly defined norms for that group are a result of elderly individuals receiving less feedback concerning who they are, what functional roles and behavior they can perform, and in general, what value they are to the social world. Lumped into one homeogenous role, that of an "old" person, they are denied a choice of roles regardless of their physical or mental abilities and become susceptible to and dependent on social labeling. Since many societal views concerning old age are negative and stereotypic, older persons are often viewed as if they are incompetent, negatively labeled and treated accordingly regardless of their personal characteristics. The meaningful roles and status they were sanctioned in younger years are replaced by ambiguous roles, lowered status and accompanying role evaluations. Through the process of socialization, the older person internalizes these negative social evaluations and behaves accordingly. As such, they may experience an actual decline in competence which reinforces their labeling themselves negatively. A

negative feedback loop is established.

In light of the earlier statement that some of the negative, cultural stereotypes have recently been challenged, the model may be somewhat overly generalized. However, most elderly individuals are not able to completely refute society's less than favorable labels. Instead, many deny they are old. They either define themselves as younger and reject any identification with the older, devalued group (Landreth & Berg, 1980) or they believe that they are exceptions to the average. The fact that many elderly people rate their peers so negatively is perhaps the best testimony of the pervasive and successful job society has done in perpetuating the negative stereotype about elderly people (Kausler, 1980).

Furthermore, stereotypes concerning the decline of mental ability in later years are emphasized in the present study. In terms of mental competence, the negative stereotypes seem to persist as strongly as ever. Perhaps the lack of opportunity to pursue the North American values of productivity, achievement and independence demoralizes and excludes them from much of society (Collette-Pratt, 1976). The environment of the elderly is characterized as being intellectually impoverished (Baltes & Labouvie, 1973). Maintaining

intellectual performance is not a norm for the aged. The withdrawal of positive sanctions and the active discouragement of competence-related behaviors are a reflection of societal expectations toward elderly individuals (Bennett & Eckman, 1973). Just as our physical well-being deteriorates when we do not exercise, so our mind deteriorates if not used. In terms of mental ability, our society adheres to a chronological definition of age to the exclusion of all other definitions despite the realities of biological, psychological and social competence (Bengston, 1973). If the atrophy of skills and the development of negative self-evaluations continue to be uncritically accepted as fact, the Social Breakdown Syndrome Model does realistically represent the process of how negative attitudes and stereotypes influence mental decline in old age.

To summarize, the concepts of role theory and the Social Breakdown Syndrome Model can be used to describe some of the negative expectations that the elderly have about their mental performance. The loss of significant roles which may include isolation from various mentally challenging occupations and educational challenges, the loss of intellectually-based norms, and the loss of reference groups, are events that can negatively influence one's perceived competence and feeling of usefulness.

This lowered expectation of competency may even contribute to lowered cognitive performance by fostering a negative feedback loop of reinforcement as explained by the Social Breakdown Syndrome. As such, the understanding of the effect of negative stereotypes on the expectation of success or failure may help us understand differences in cognitive performance.

Role Theory and Locus of Control

The effects of negative attitudes and stereotypes about cognitive performance would be particularly significant if it were found that elderly individuals who were competent in many other areas of their lives, still believed the stereotype of cognitive decline with age. One's locus of control orientation may differentiate elderly individuals who generally accept or do not accept society's role definitions. It has proven to be a reliable measure with which to predict one's adjustment and level of competence in old age (Kuypers, 1972; Palmore & Luikart, 1972; Wolk & Kurtz, 1975).

Locus of control is based on generalized expectancies concerning how one interprets reinforcement (Rotter, 1966). Individuals are conceived to vary along a dimension which ranges from high internal to high external. Persons who score highly on internal control

are those who believe that reinforcements are dependent on their own behavior, capacities and attributes. They have a high expectancy for personal control (Rotter, 1966). For example, successful results on academic performance would be attributed to one's effort and hard work. General research findings, including studies involving elderly subjects, report high correlations between adaptive behaviors and a high internal locus of control. Cognitive complexity, self-confidence, insight, flexibility and sensitivity are a few of the behavioral traits found to correlate with high internal locus of control for elderly subjects (Kuypers, 1972; Wolk & Kurtz, 1975).

In contrast, persons who score highly on external control are those who believe they do not have personal control over reinforcements but rather are controlled by more powerful others, luck, chance, or fate (Rotter, 1966). Successful academic performance would be attributed to having good luck or to the teacher liking them. Dissatisfaction with life, ineffective coping styles, defensiveness, anxiety, apathy and susceptibility to the influence of others are characteristics that have been found to correlate with external locus of control for the elderly (Kuypers, 1972; Wolk & Kurtz, 1975).

The internal/external division is not meant to imply

that there are two distinct personality types and that everyone can be classified as one extreme or the other but rather there is a continuum. Persons differ in their general tendency to attribute satisfactions and failures more to themselves or more to external causes (Rotter, 1966). Furthermore, one's orientation may be content specific.

According to Rotter (1971) one's locus of control orientation is relatively stable throughout one's life. There is some question, however, whether or not one's locus of control orientation remains stable between middle and old age (Box & Peck, 1981; Wolk & Kurtz, 1975; Felton & Kahana, 1974; Palmore & Luikurt, 1972; Kuypers, 1971). The answer is a particularly important one. Perceived choice and a sense of personal control are critical determinants of the aging individual's physical and psychological well being (Schulz & Hanusa, 1980). It is becoming apparent that presumably objective physical conditions, such as illness and health, are greatly influenced by subjective perceptual dimensions and by the feedback one receives from his/her attempts at coping. Attributional processes, feelings of control and the efficacy of one's coping responses all seem to affect one's ability to function (Rodin, 1980).

If there is a tendency among older individuals to become more external as Box & Peck (1981) and Felton & Kahana (1979) found, it is possible that the change is motivated by role changes that are forced upon elderly individuals and by the uncritical acceptance of the concomitant negative stereotypes. This would suggest that at least some of the subsequent decline in old age may be due to non-biological factors. If, on the other hand, individuals experience growth in internality throughout their adult years, based possibly on prolonged experience, occupational and social effectiveness in their environment, we might also expect them, like other internals, to adapt well to the aging process and find satisfaction in their later years (Palmore & Luikart, 1972). This may in fact be true in terms of the many social aspects of their lives. However, it is my argument that this does not generalize to cognitive related norms. In the social realm, many elderly couples report more satisfaction with their spouses than at any other time in their lives and those who have pursued meaningful avocations are happy to leave the responsibilities of the working world (Zube, 1982). However, when it comes to evaluating their cognitive abilities, most elderly individuals, whether internally or externally oriented, are convinced that decline is inevitable. Any sign of memory lapse is offered as proof (Perlmutter, 1978).

Similar characteristics to an external locus of control are those related to the concept of learned helplessness, or the adoption of a "what's the use" attitude (Kausler, 1982). Prolonged exposure to unavoidable, aversive stimuli often precedes the adoption of such an attitude and leads the individual to the inaccurate belief that he/she is incompetent. The individual then gives up and becomes passive. The results are clearly negative. Individuals do not receive the positive outcomes they could be receiving. They cease to learn what could be learned from the situations they are in and they begin to experience a loss in their self-esteem (Langer, 1979). Although adoption of the attitude is not limited to the aged population, elderly subjects are more prone to the manifestations of learned helplessness than the young and for all age groups externals more than internals (Kausler, 1982).

Kuypers and Bengtson (1973) agree that the elderly are particularly vulnerable to the manipulations of others and suggest that we encourage an internal locus of control in order to break the vicious cycle of social and competency breakdown. The internalization of control and decision-making power mitigates one's complete susceptibility to other's opinions by placing the

responsibility for action on the individual him/herself.

The data is equivocal as to whether or not locus of control orientation changes in old age, and in what direction it changes if it does. It is possible that many elderly individuals are moving towards internality and therefore are more impervious to social expectations and labeling. However, it is my hypothesis that their imperviousness is domain specific and only generalizes to social aspects. Internal control orientation does not necessarily insure that the aged will reject all popular beliefs, especially the very strongest ones. The stereotype of cognitive decline with age is still so widely accepted as fact and is so overpowering that even internal elderly may have difficulty ignoring it to some degree. The individual might internalize the popular notion, gracefully accept it as a natural concomitant of old age and compensate in other domains. Negative stereotypes are potentially damaging but this particular stereotype is perhaps the most widely accepted. We are socialized into accepting it as a norm and, in addition, it is supported by years of narrow research. In the face of salient stereotypes that exist with respect to cognitive abilities, how can we expect elderly individuals to deny them?

Chapter III

Literature Review

The focus of this study was on negative stereotypes and their effect on the elderly person's ability to accurately assess his/her level of cognitive performance. Included in the analysis was the relationship of locus of control orientation to cognitive performance level. A review of the following topics is covered: the relationship of locus of control to intellectual and social behavior, locus of control across the life span, memory and learning across the life span and the influence of stereotypes and attitudes on performance.

Locus of Control In Intellectual and Social Behavior

Consistent results show a correlation between one's locus of control orientation and a number of personality traits related to performance level. Research involving personality characteristics and locus of control show that internals have a greater tendancy to seek information and adopt behavior patterns to facilitate personal control over their environments (Joe, 1971). Specifically, studies have found personality orientations such as intellectual-efficiency, insight, coping skills,

flexibility, adjustment and well-being, competence, cognitive complexity and autonomy, to be more characteristic of internals than externals (Kuypers, 1972; Palmore & Luikart, 1972; Wolk & Kurtz, 1975).

A number of studies provide strong support for the hypothesis that individuals who have strong beliefs that they can control their own destiny are likely to: (a) be more alert to those aspects of the environment which provide useful information for their future behavior, (b) place greater value on skill or achievement reinforcements and are generally more concerned with their ability, particularly their failures, and (c) be resistive to subtle attempts to influence them (Rotter, 1966).

Although the correlation between locus of control and measures of intelligence have generally been around zero, internals are more likely than externals to be higher achievers. Certain personality characteristics that pertain to cognitive performance explain why this might be the case. When studying high school youths, Franklin (cited in Lefcourt, 1963) found correlations between the I-E scale and reported evidence of achievement motivation. Such evidence included early attempts to investigate colleges, intention to go to college and amount of time spent doing homework. Rotter (1966) found that people who

are confident that they control themselves and their destinies, tend to be surer of themselves and better educated. So, although one's locus of control orientation cannot predict a level of actual performance, it seems that it can predict behavioral strategies which influence an individual's level of performance.

Additionally, internals are shown to be more overt achievers. Cellura (cited in Phares, 1976) found a positive relationship between Science Research Associates (SRA) academic achievement tests of lower socio-economic status boys and an internal locus of control with IQ partialled out. In another study, internal control was found to be positively related to achievement for all minority groups except Oriental Americans (Coleman, et al, 1966). Significantly higher ratings of self-esteem were found in Upwardbound children who had internal locus of control orientations compared to those with external locus of control orientations (Joe, 1971).

A number of studies have found that internals attempt to better their life condition and to seek information that might help them control their environment in important life conditions. Seeman & Evans (1962) found that the internals among tuberculosis patients knew more about their condition, questioned doctors and nurses more

and expressed less satisfacion at the amount of information they received about their condition. In another study, Seeman (1963) compared internal reformatory inmates to external inmates. He found that independent of intelligence, internal reformatory inmates remembered more information about how the reformatory was run, about parole, and about long-run economic facts which might affect the person after he/she left the reformatory.

Related to the idea that internals attempt to control their environment, Phares (1976) found that they are also more resistant to subtle suggestion. They are more inclined to seriously consider any persuasive information before accepting it as fact. To accept influence without due regard to the validity of its content or to accept a persuasive message without analyzing the content would abrogate an internal's own control. Externals, on the other hand, more readily conform to the judgments of others when in a social situation and are less likely to depend on their inner resources in formulating an independent judgment.

Hersch and Scheibe (1967) found that internal subjects are likely to describe themselves as active, striving, achieving, powerful, independent and effective. Internality was found to be consistently associated in a

positive direction with indexes of social adjustment and personal achievement.

In summary, internals, those who tend to perceive what happens to them as dependent upon their own actions, have greater motivation to achieve and behave in ways that increase their chances of success. Externals do not seem to have such motivation. Support is therefore offered for the hypothesis that belief in one's own ability to control the environment through one's own behavior can be reliably measured through Rotter's locus of control measure and is predictive of certain positive behavioral strategies.

Locus of Control Across the Life Span

Locus of control orientation is relatively stable after maturity with fluctuations typically taking place during child development (Penk, 1969). Internal control seems to increase as a child matures. Age and accompanying growth in the capacity to care for themselves, independence and ability to influence their surroundings, as well as cognitive understanding, increases the strength of children's belief in their own internal control. Crandall, Katkovsky and Crandall (1965) noted this trend from around third grade to tenth grade, at which time there was a slight reversion to a more external orientation, particularly with males. Perhaps

the prospect of leaving the structured environment of school and family or the role confusion characterised by Erickson's theory (1950) results in uncertainty and a more externally oriented outlook on life. Basically this reversion only lasts a few years.

Throughout one's adult life, one's locus of control orientation remains relatively stable. Those who are more internal generally remain so. One's orientation, however, may be altered in either direction by the forces of world or national events. As well, special training programs and a variety of therapeutic techniques have successfully increased subjects' internal focus which allows them to function on a more efficient and independent level (Phares, 1976). Both Schulz (1976) and Langer & Rodin (1976) did studies with institutionalized elderly individuals and found that their competence in life skills increased when they were made to feel they had control over some important decisions regarding their lives. Hanusa & Schulz (1977) suggest that lack of control is most devasting when it carries with it broad implications about the individual's self-worth. Schaie (1977) has suggested that an aged person's functioning could be enhanced if negative feelings about adequacy and perceived value were modified. Similarly, Kuypers & Bengtson (1973) suggest that the social breakdown of the elderly, a

process whereby the elderly person is defined as useless and therefore eventually views him/herself as incompetent, can be counteracted by interventions which enhance feelings of competence in social role performance, adaptive capacity, personal feeling of mastery and inner control.

Whether or not individuals revert to a more external orientation with advanced age is equivocal. Birren (1958) and Gould (1972) suggest that the transition from adulthood to old age often represents a loss of control both physiologically and psychologically. Wolk (1976), on the other hand, found that the developmental processes of aging do not necessarily lead to a reduction in the expectancy for internal control. His elderly sample scored at a level of internality similar to a college-age population. Wolk and Kurtz (1975) found that non-institutionalized elderly individuals scored more internally on Rotter's Scale (1966) than younger samples. For some elderly people, belief in external control is not a by-product of growing old.

It is also questionable what is best for the elderly (Felton & Kahana, 1975). In the case of institutionalized care, perceived external control may indicate a healthier, more adaptive orientation since residents of homes for the

aged generally experience a diminished capacity for controlling their environments. However, for the majority of elderly persons not under institutionalized care, it has been suggested that those who maintain an internal locus of control will adapt more successfully to their own old age (Rodin, 1980). Furthermore, Rotter (1966) found that internal elderly individuals are more satisfied with their lives than externals. Kuypers (1971) found that positive coping styles are more characteristic of the elderly internal person.

In summary, although locus of control is a relatively stable characteristic throughout one's young and middle adult years, the research is equivocal as to the stability and the value of one specific style in old age. The most important factor may be the feasibility and adaptability of maintaining an internal control orientation in an elderly person's present environment. Individuals who strive to maintain their internality may be unduly frustrated in certain environments such as nursing homes where most decisions are made by the professional staff. However, when it is feasible to remain so, internal aging individuals seem to have certain advantages over their external cohort members. Furthermore, society, with its stereotypes and negative attitudes about aging, may be responsible, in part, for making it difficult for elderly

individuals to control their lives and to maintain an internal locus of control. Such an unsupportive environment is conducive to development of negative self-concepts, lowered feelings of self-worth and stereotypic behaviors among the aged. Environmental variables may also result in content specific changes. For example, we might ask if elderly internal subjects are more externally oriented when assessing their cognitive abilities because of the strong stereotypes that persist about cognitive decline but not when assessing other abilities such as social skills.

Learning and Memory Across the Life Span

Much of the early research in memory and learning was based on cross-sectional designs and gives evidence that elderly subjects perform less well than young subjects in these experimental studies (Botwinick, 1973; Craik, 1977; Horn, 1976). However, experimental factors such as lack of interest, unfamiliarity with testing situations, and the type of test used, may have an influence on performance level and therefore particularly bias results against elderly subjects.

Besides using the limited cross-sectional design, much of the research supporting age differences in performance levels, in favor of the young, has utilized

measurements that may also be biased against the elderly. Many of the tasks measure verbatim associative memory, known to be problematic to older individuals, rather than semantic memory/learning which seems to be less affected by age (Warrington & Sanders, 1971; Okun, Siegler & George, 1978; Kausler & Klein, 1978). For instance when comparing young adults and the elderly, verbatim memory research shows that the elderly perform less well on a paired associate tasks or memory word lists (Kausler, 1982); whereas, semantic prose learning shows no such age difference (Labouvie-Vief, 1973). Furthermore, it is possible that at least some of the deficits due to these measurements are a matter of diminishing interest and motivation to perform such tasks rather than true intellectual decline. Older people may resent doing tasks that they perceive to be meaningless and which have little or no interest to them (Hulicka, 1967; Bolton, 1978).

Zelinski, Gilewski & Thompson (1980) have argued that prose materials are a more ecologically valid source of information than a word list. The advantages of using a comprehension or memory/recall test based on a prose passage are that the subjects might find the material more meaningful and, as a result, more motivated to remember it. It also increases the chances that the memory skills measured have some applicability to real world memory

phenomenon and have been used more recently by the elderly. Based on these advantages, it is felt that prose-learning tests are less biased in obtaining a competence measure which represents an older individual's cognitive ability.

Besides measurement biases, there is some literature to suggest that one's (e.g. elderly) learning/memory is not a uniform system. Labouvie-Vief (1980) suggests that when studying age and cognition, researchers must look simultaneously at the integration of information at several levels. Although one may find evidence of deficit when focusing on one level, that deficit may be made up at another level. For example, while memory for immediate detail shows marked decline in later life, memory for patterns and relationships improves.

It therefore appears that, compared to young adults, the memory/learning performance of elderly persons is worse in some circumstances and equal in others. Possibilities, such as design and measurement biases, lack of interest and motivation, are given to explain the differences. It is argued here that socialization into the role of the aged, with its accompanying norms can be another important factor accounting for memory/learning differences. In order to test this hypothesis, an attempt

was made in this study to eliminate other confounding factors. In order to maximize elderly subjects' cognitive performance, prose materials were used. It was felt they were a more ecologically valid source of information than a word list.

Influence of Attitudes on Performance

Psychological tests indicate that attitudes influence human memory and learning (Bower, 1978). Bower found that if individuals believe they will not do well, then their test performance level will be low. Such data, that negative expectations interfere with effective task performance and may become a self-fulfilling prophecy, is used as an argument in childhood education and cognitive anthropology to obtain funding for programs like Head Start (Baratz, 1970). Little, however, has been explored in terms of the negative effects of stereotypes and attitudes on test performance by the elderly. If one extends childhood literature to the aging person, it is possible that a positive relationship between negative stereotypes and attitudes and decreased cognitive competency in old age does, in fact, exist.

For the purpose of this study, metacognition skills are used to measure the subject's ability to estimate how well they will perform. In other words the metacognition

accuracy score is used as an attitude measure. Metacognition is the term used for one's ability to know about knowing; it is a measure of attitude about one's ability. Most people have a sense of what they do and do not know. Wellman (1977) sees cognitive awareness as the foundation of efficient learning since deliberate strategy-based acquisition and use of appropriate knowledge are indications of intelligent behavior. If this declines with age, elderly persons will cope less efficiently with the environment than their accumulated knowledge base would otherwise permit. They will not know how to efficiently manipulate their environment as well as they did in earlier years. If it remains efficient and accurate, the performance of the elderly in everyday memory situations might be just as adequate as that of the young, even in the presence of some minor cognitive deficits (Lachman, Lachman & Thronesbery, 1979).

Even though a metacognition accuracy score is used as an attitude measure in this study, metacognition skills are basic to human learning. Not only do we think and perform tasks, but it is critically important that we be aware of the processes involved. Flavell (1977) sees, for example, a connection between how well a person learns and remembers and: (a) what he/she is like as a learner, (b) the amount and kind of information to be learned and (c)

what behavior he/she engages in to learn. A deficiency in this ability cannot help but lead to inappropriate task strategies and ultimately poorer performance (Lawson & Ledford, 1980). As such, the elderly's attitude about their performance ability may be as important as their actual performance.

Chapter IV

Hypotheses

The purpose of the present study was to investigate elderly subjects' attitude concerning their cognitive performance as measured by metcognition skills and to test whether stereotypes (operationalized as positive/negative feedback) and locus of control orientation had an effect on elderly individuals. The researcher was unable to obtain an elderly external sample and so it was imperative that a young control group comprised of externals and internals be used for comparisons. Because of the strong, negative stereotypes about mental decline with age, a general hypothesis was made that elderly individuals are affected by feedback, particularly negative feedback, when they assess their cognitive abilities. In short, feedback was assumed to represent stereotypes. This effect of feedback may, or may not be reflected in their actual cognitive performance. It is assumed that any effect that might be found for internals would be increased for externals.

Based on a review of the literature the following hypotheses were made:

1) Elderly internals will be more influenced by feedback, particularly negative feedback, than young internals in terms of metacognition accuracy scores.

2) Although effort was made to choose tests that were ecologically fair for both age groups, young internal subjects will, to some degree, outperform elderly subjects on cognitive tests.

3) Young external subjects will be more influenced by feedback than young external subjects in terms of metacognition accuracy scores.

4) Young internal subjects will perform at a higher level than young external subjects on cognitive tests.

5) Internal elderly and external young subjects will be affected by feedback in a similar way when compared to young internal subjects in terms of metacognition accuracy scores.

6) Internal elderly subjects will outperform external young subjects on cognitive tests.

Chapter V

Methods

Subjects

The subjects were 20 internal elderly (6 males, 12 females), 20 internal young (11 males, 9 females) and 20 external young (8 males, 12 females) participants. All subjects were healthy and were not presently taking drugs that affect memory. Both of these factors were determined by self-report. To be eligible for this study, the young and elderly subjects were required to speak fluent English, be normally active and have no noticeable deficits in memory or orientation. Except for age and locus of control, subjects were randomly assigned to treatments. Age, sex, ethnic, educational and medical history were included as descriptive data for the purpose of selecting the sample only.

The elderly group, mean age 69.8 years (range 60-81 years), were selected from a group of 80 people who expressed an interest to participate in learning studies. This larger subject pool was initially recruited by distributing a questionnaire to various civic

organizations in a large Western Canadian city (see Appendix A). Many of the subjects were contacted while attending a spring session for seniors at the University of Alberta. A second questionnaire, Rotter's Locus of Control Scale, was sent to those who met the requirements stated above (see Appendix B).

The young group, high school students between the ages of 15 and 18 years of age ($\bar{x}$ = 16.7 years) were randomly selected from a suburban school district near Edmonton. Students were enrolled in academic or general programs. Special Education students were not included. In addition to being asked if they were on medication that might affect memory, the younger students were asked if they had taken any drugs on the day they were tested. No one had to be eliminated from the study for this reason. This specific age group was selected because the subjects should be at one of the two higher levels of cognitive performance according to a Piagetian framework (Flavell, 1977) and, in addition, the sample should represent a more random group than college students. The younger subjects were further selected so that there was an equal number with internal and external locus of control (N = 20 per group). Only elderly internals (N = 20) were compared to the two younger groups because there were only three elderly externals in the larger elderly sample.

Materials

Rotter's I-E Scale (Rotter, 1966) was used to determine the subject's locus of control orientation. Two sets of materials were used to measure the dependent variables. A metacognition test was administered to find out how well the subject expected to perform on the comprehension tests. Next, a series of three comprehension tests were given to determine the level of performance on memory/learning tasks.

Rotter's I-E Scale. The scale used in the present study was developed by Rotter (1966) and is considered one of the best tests for use with all adult populations (Troop & MacDonald, 1971). This scale reportedly measures one's general locus of control orientation and represents personal beliefs about important life issues involving politics, family and education. The use of the word "control" refers to the perceived contigency of events in terms of positive and negative outcomes (Lefcourt, 1976). In other words, the scale is used to measure whether the person's general tendency is to attribute satisfactions and failures more to themselves or more to external causes (Rotter, 1966).

Rotter's Scale is a questionnaire consisting of 29 paired alternatives of which six are filler statements. Each of the twenty-three non-filler paired alternatives are opinion statements concerning broad issues such as politics, education, the family, social and work relationships. The respondent is asked to select one statement (A or B) that s/he more strongly believes to be true from a pair of alternatives. The following is an example of a paired alternative concerning an educational issue: A.) Sometimes I can't understand how teachers arrive at the grades they give; B.) There is a direct connection between how hard I study and the grades I get. Item (A) represents an external orientation. The respondent feels that grades are determined by factors outside his/her control. Item (B) represents an internal orientation. The responsibility for one's grade lies within the person's motivation and hard work. It is sometimes hard to choose between the alternative (A) or (B) but respondents were reminded to choose the one they feel most strongly about whether or not they agree with the statement completely.

The score was based on the total number of external statements that were selected. Individuals with scores of eleven and below were designated as "internals" and those with scores of thirteen and above, were designated as

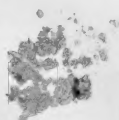
"externals" as Rotter (1966) suggests. Those scoring twelve were not used in the study.

The scale has been found consistently reliable. Test-retest reliability for a one-month period was consistent in two different samples of undergraduates from Ohio State University with coefficients of 0.60 for males, 0.83 for females and 0.72 combined. A coefficient of 0.78 was obtained for a sample of prisoners at the Colorado Reformatory (Rotter, 1966). Internal consistency is relatively stable. Split-half correlations resulted in a coefficient of 0.65 for the Ohio State University sample and Kuder-Richardson reliabilities resulted in a coefficient of 0.69 for a National Stratified Sample Purdue Opinion Poll (Rotter, 1966).

Rotter's free-choice scale has been correlated with other methods of measuring internality/externality. Dies (1968) developed a projective measure for discriminating internal/external oriented individuals from TAT stories. He found that internally oriented subjects as determined by Rotter's Scale told significantly more TAT stories manifesting a belief in internal control while externally oriented subjects gave significantly more stories representing a belief in external control. In a study of academic failure, Cardi (cited in Joe, 1967) developed a

measure of internal/external control from a semistructured interview. Judge's ratings were correlated with Rotter's I-E Scale scores after the interviews were held. A biserial correlation of 0.61 (p=0.002) was obtained when comparisons were made between subjects rated high or low from the interview data and the I-E Scale scores.

Rotter's measurement does not reflect a person's choice based on social desirability, nor is it a test of intelligence. Correlations with the Marlowe-Crowns Social Desirability Scale rendered coefficients of -.16 to -.29 in four sample groups from Ohio State University (Tolor & Jalowiec, 1968). Likewise, Rotter (1966) stated that correlations with intellectual measures yielded coefficients of -0.01 to 0.01 in two sample groups from Ohio State University and one sample group of Ohio Federal Prisoners. Thus, relationships with confounding test variables such as social desirability and intelligence are low and therefore indicate better discriminant validity for other personality characteristics.



In summary, Rotter's scale is reliable and shows reasonable internal consistency. Relationships with such test variabilities as social desirability and intelligence indicate good discriminant validity on other personality characteristics and its results correlate well with a

variety of test methods such as semi-structured interviews and projective tests.

Metacognition Test. The metacognition test consisted of three questions which measured one's ability to estimate how well one thinks he/she will perform on a cognitive task. It was not a formal test but rather a series of questions answered by the subject before taking the memory/learning tests. First the directions for the cognitive test were fully explained. If there were no questions about the nature of the cognitive test the subject answered the following questions: (a) Keeping in mind the nature of the task, how many questions do you think you will answer correctly? (b) Compared to high school students (for the elderly participants) or elderly (for the high school students), how well do you think you will do? (c) Compared to other individuals your age, how well do you think you will do? The answer to question (a) provided the subject's metacognition score. The answers to questions (b) and (c) were for the experimenter's interest and were not used in the statistical analysis. Following completion of the comprehension test, the actual performance score was subtracted from the metacognition score. An accuracy prediction score was thus obtained for the analyses. A zero score indicated a perfect prediction. Overestimation of one's ability was indicated

by a positive score, whereas, underestimation was indicated by a negative score.

Memory/Learning Tests. The cognitive tests consisted of three short exercises based on the reading of two essays and one graph. Each test represented a different level of comprehension as presented by Bloom (1956) in the Taxonomy of Educational Objectives in the Cognitive Domain. Knowledge of Specifics, Comprehension, and Evaluation were the three levels being tested.

The first level, Knowledge of Specifics, referred to information or knowledge which can be isolated and remembered verbatim as opposed to knowledge of universals and abstractions. The test required the participant to learn and store in his/her mind certain information and to be able to recognize the facts when presented in multiple-choice questions. The essay and the questions were adapted from an SRA Reading Kit - Lab IVa (Science Research Associated Inc., 1959) designed for eleventh grade students. The essay was four paragraphs in length and consisted of approximately two hundred words.

The second level, Comprehension, tested the subject's understanding and interpretation of general information. In this particular test the information was presented in

the form of a graph. The content concerned provincial expenditures for the fiscal years 1929 to 1940. Ten questions were asked relevant to the graph. The subject referred to a graph in order to decide whether each of ten statements was true, probably true, false, probably false or not sufficiently informative to indicate any degree of truth or falsity. The learning test and test-items were adapted from an example provided in Bloom's Taxonomy of Educational Objectives (1959).

The third level, Evaluation, tested the participant's ability to make a judgment about a controversial situation. The facts were presented to the reader in the form of an essay. It was approximately 125 words in length and consisted of two paragraphs. The reader was asked whether or not baseball players should be entitled to unemployment insurance during the off season and then was given some data on the topic. The subject read the essay and was provided three possible conclusions. He/she was then asked to choose the most logical conclusion. Each of the three conclusions were considered correct. Based on their initial choice of a conclusion, subjects were then asked to select from five statements those which supported the conclusion, those which contradict the conclusion and those which have nothing to do with the conclusion. The test was adapted from an example provided

in Bloom's Taxonomy of Educational Objectives (1959). (The three learning tasks and the respective test items are provided in Appendix C.)

Procedure

Subjects were contacted on two different days. On the first day subjects were tested for locus of control and placed into one of three groups. On a later day, three metacognition scores were obtained which were followed by completion of the three comprehension tests.

Locus of Control (Day 1). Rotter's I-E Scale was administered to subjects before selecting the actual sample. The questionnaire was mailed to fifty elderly subjects (18 males, 32 females) and they were asked to return it by mail. Stamped envelopes were enclosed. Thirty-seven (14 males, 23 females) of the 50 elderly individuals returned their questionnaires. The researcher administered the questionnaire to 60 younger subjects (29 males, 31 females) in their classrooms at school. This involved four different classes with approximately 15 students in each class. Each class was tested separately and all class members participated.

All subjects received written instructions. Subjects were given the following instructions: (a) choose the statement in each pair about which you feel most strongly;

(b) each item is to be chosen independently and is not to be influenced by previous answers; (c) there are no right or wrong answers. Subjects were asked to work independently and to answer all questions without discussing the items with anyone else.

Of the 37 elderly respondents only three were external (1 male, 2 females). Therefore, it was decided that only elderly internals would be further tested. They would be compared to the young external/internal control groups. This left three groups: elderly internals, young internals and young externals. From each of these three groups, 20 subjects were randomly selected. At this point all groups were randomly divided into two treatment groups (positive and negative feedback) which created six independent treatment groups.

Feedback, Metacognition Tests and Cognitive Tests (Day 2). Either positive or negative feedback was provided to the six groups before answering the metacognition tests to see if any of the three subject groups were differentially influenced by the different feedback. Those who received negative feedback were told that research indicated that people their age often found these tasks difficult. The positive feedback groups were told that research indicated people in their age group did

very well on these particular tasks. After they heard this pre-test statement about their likelihood of doing well or having difficulty with the exercises, the subjects were asked to estimate how well they expected to perform (metacognition score) on a specific cognitive task. Finally they were asked to perform that task. This procedure was followed for each of the three tasks.

The procedure for the metacognition questions was as follows. Before the learning task, subjects were given explicit, oral directions about the learning/memory task they would receive. For example, before the first task, they were told that they would read an essay, the essay would be collected and then they were to answer ten multiple-choice questions. Before actually doing the task they were asked to answer the three metacognition questions on a separate sheet. After completing this sheet they were given the corresponding learning task. This procedure continued for the three memory/learning tests with prior metacognition questions.

For the cognitive tests, all participants completed the same three tests in the same order. They silently read the test materials to themselves. For the Knowledge of Specifics Test, the essay was collected before the subjects were given the multiple choice questions. For

the remaining two tests, subjects were allowed to use the written material as reference while answering the questions.

The tests were administered to the elderly subjects at the university and to the young subjects at their high school. The testing took about one and one-half hours. There was no apparent difference between the young subjects and the elderly subjects in terms of how long it took for completion of the tasks. At the end of the session, subjects were debriefed by explaining the true purpose of the positive and negative feedback and any questions were answered. Requests for general results were sent to the subjects who asked for them. Individual comparisons were not provided.

Data Analysis

The hypotheses were first tested using an overall 2 X 3 analysis of variance on two between subject factors for each of the two dependent variables. The between subject variables were groups (elderly internal, young internal and young external) and feedback (positive and negative). The specific hypotheses were tested by individual ANOVAs. A program from the Statistical Package for Social Sciences (SPSS) (Hull & Nie, 1981) was used to test all ANOVAs. A hypothesis-wise alpha level (Kirk, 1968) was set at 0.05.

The two dependent variables were metacognition scores and cognitive scores.

Chapter VI

Results

For this study, the dependent variables were the metacognition accuracy scores and the cognitive scores. Metacognition accuracy scores were the summed scores of the three metacognition tests. To obtain this score, each metacognition score was subtracted from its corresponding comprehension score. Cognitive scores included the combined scores of the three comprehension tasks. The correct number was out of a possible 25. The two independent variables included groups determined by age and locus of control (elderly internals, young internals and young externals) and feedback (positive and negative).

The two-way ANOVAs on the three groups and feedback revealed no significant differences on either dependent variable except for a main effect on the metacognition scores for feedback ($F=4.28$, $p=0.04$). Table 1 reveals that metacognition scores were generally higher for positive rather than negative feedback.

There was only one significant main effect and no significant interactions between age and feedback on

Table 1

Effective of Feedback on

Metacognition Scores - Means

Groups: Total Sample	Feedback		Summed
	Positive	Negative	Mean
Elderly Internals	3.90	2.20	3.05
Young Internals	4.10	3.10	3.60
Young Externals	3.90	-0.10	1.90
Mean	3.97	1.73	2.85

Table 2

Effect of Feedback on

Metacognition Scores - Means

Groups: Partial Sample	Feedback		Summed
	Positive	Negative	Mean
Elderly Internals	5.20	0.00	2.60
Young Internals	3.60	6.00	4.80
Young Externals	3.60	0.60	2.10
Mean	4.13	2.20	3.17

metacognition accuracy scores or cognition scores when internal elderly subjects were compared to young externals. The significant main effect was between elderly internal and young external and again it was for feedback ($F=4.31$, $p=0.05$). The two-way ANOVAs on locus of control and feedback between the two young subject groups again only showed one significant result for metacognition accuracy scores for the main effect on feedback ($F=3.96$, $p=0.05$). Table 1 shows the mean scores for metacognition by feedback for each group. One can see from the table for both main effects the scores were higher for positive feedback than for negative feedback. See Appendix D for a complete set of source tables on the above analyses.

A post hoc analysis on the two internal groups did reveal a significant difference in locus of control scores between ages which might have biased the results ($t=2.97$, $p=0.01$). The mean locus of control score for elderly internals was 6.45 and the mean locus of control score for the young internals was 8.60 which suggests that the elderly were more strongly internal. Therefore, any difference that might be attributed to the effect of feedback on age, could be counterbalanced by the extremely internal nature of the elderly sample. It was decided at this point to match the internals on locus of control scores. This cut the sample in half and resulted in ten

elderly internals (mean locus of control score = 7.8) being matched with ten young internals (mean locus of control score = 7.8). In addition, ten young externals (mean locus of control score = 15.6) who scored highest on Rotter's Scale were selected in order to maximize the difference between internal/external scores. Post hoc analyses of variance were then done on this reduced sample to test the hypotheses. No significant differences were found for any analyses on the cognitive scores and there were no significant main effects on the overall ANOVAs; however, a significant feedback by age interaction for metacognition accuracy scores ($f=3.64$, $p=0.04$) became apparent in the direction suggested in hypotheses one and three. The scores in Table 2, summed across feedback, show that the interaction was probably due to the young internals greatly overestimating their ability under both types of feedback, whereas, the elderly internals and young externals only slightly overestimated their ability. In addition, the two-way ANOVA comparing the elderly internals to the young internals indicated an interaction between age and feedback on metacognition accuracy scores ($F=5.78$, $p=0.03$). Figure 1 shows that elderly internals greatly overestimated their cognitive scores when given positive feedback and correctly estimated their cognitive scores when they received negative feedback whereas young internals greatly overestimated with both feedbacks. This

Figure 1

Age vs. Feedback (Internals)

for Metacognition Accuracy Scores

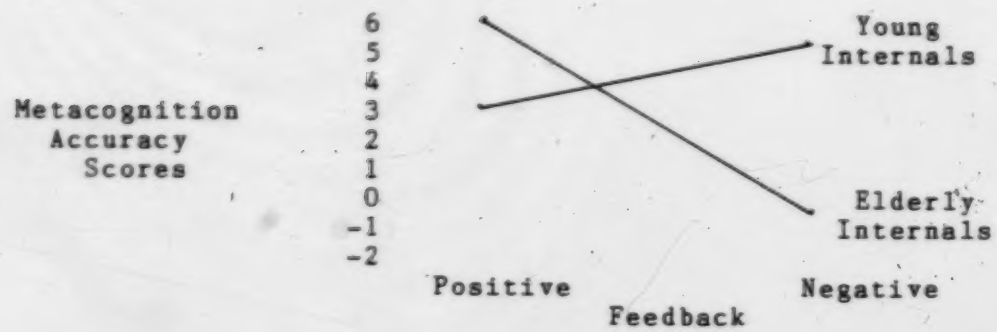
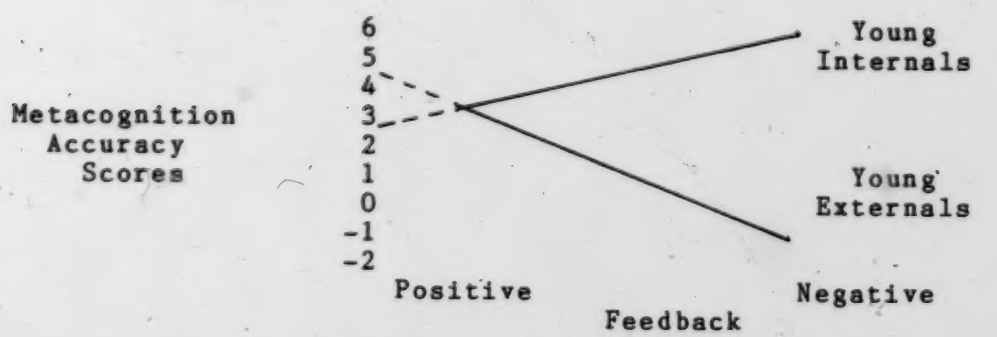


Figure 2

Locus of Cotrol vs. Feedback

for Metacognition Accuracy Scores



difference between elderly and young internals is especially important since elderly internals and young externals performed similarly. There was no main effect for age and no interaction was found between age and feedback on metacognition scores for the elderly internals and young externals. Table 2 shows that elderly internals and young externals overestimated their scores when they received positive feedback and estimated a nearly accurate score when they received negative feedback. Adding support to the comparison of elderly internals to young internals is the finding that the interaction between feedback and locus of control on metacognition scores for the young subjects ($F=3.40$, $p=0.08$) almost reached significance. Figure 2 shows that young externals overestimated metacognition scores when given positive feedback and were much closer to their correct scores when they received negative feedback. Young internals, on the other hand, always overestimated their scores.

Again there was a main effect for feedback on metacognition accuracy scores with those who received positive feedback scoring higher than those who received negative feedback. The feedback main effect was between young externals and elderly internals ($F=10.10$, $p=0.01$) and did not interact with age. The Source Tables for all analyses on this partial sample are given in Appendix E.

Chapter VII

Discussion

The present study investigated the extent to which elderly participants with an internal locus of control orientation were affected by stereotypes concerning their cognitive abilities. Either postive or negative feedback about how well they would probably do on three comprehension tests was given to the subjects before taking the tests. Research indicates that internals are generally less influenced by feedback than externals. It was hypothesized, however, that in respect to cognitive abilities, elderly internals would be as easily influenced by the experimenter's information as young externals. The young internals were expected to resist being influenced.

The hypotheses were not supported when the entire sample was analyzed. However, hypotheses involving metacognition accuracy were supported in a post hoc analysis which matched elderly subjects and young subjects on internal scores. This decreased the sample to half the number of subjects but was considered necessary because of the significant difference between mean scores of the elderly internals and the young internals. The

results of the post hoc analysis suggest that when the sample is sufficiently differentiated on internal/external locus of control, then elderly internals and to a lesser degree young externals are influenced by the expectations of others. Young internals are not.

In terms of this study, elderly participants responded to negative feedback by evaluating their expected performance more negatively than when they were given positive feedback. These negative expectations were not, however, reflected in their actual test scores. The results were in the same direction , but more extreme than, those found for the young externals in terms of metacognition scores. Such results support a general role theory model and specifically the Social Breakdown Model. That is, we learn who we are, our roles and status, from others and as we age, we evaluate ourselves according to other-based norms even if those norms are not reality based. This study shows that this is true for the aged even for those who have a general internal locus of control orientation. These norms have a negative effect on the elderly. Since our society has certain sets of negative expectations with regard to aging, it is likely that aging individuals will be treated in a negative manner. Furthermore, to the extent that elderly individuals internalize the stereotypic beliefs, they may

also begin to act in a manner consistent with the stereotypes (Rodin & Langer, 1980).

Research on locus of control orientation also suggests that externals at any age are more influenced by feedback from others than internals. The data here contradicts the literature. In the present study young externals, when compared to young internals, showed a small move in that direction. Elderly internals, on the other hand, greatly conformed to the feedback they received. This suggests that the data concerning younger subjects and locus of control may not directly apply to the elderly.

Based on the extensive research involving personality characteristics of internals, and my subjective analysis of the present sample, the results of the post hoc analysis suggested that elderly internals basically adjust well to old age. They are adaptive, they generally are satisfied with their lives and they deny many of the negative stereotypes about old age. However, they continue to be influenced by the negative feedback about cognitive performance which suggests that they will be influenced by the more strongly held negative stereotypes such as those concerning decreased cognitive abilities in later years. Although they have an internal orientation

of reinforcement when it comes to many aspects of their lives, their evaluations of their own cognitive abilities are, at least to some degree, externally controlled by the attitudes of others and by the stereotypes they have accepted as the result of socialization.

No significant results were found when the entire sample was analyzed. This may have been due to a number of difficulties. The first involved the use of secondary high school students. It was originally decided that high school students represented a less biased group of subjects than university students. However, the division of internality/externality may be less clearly defined in adolescence. Although locus of control is a relatively enduring adult personality trait, it may be particularly unstable during the adolescent years. Crandall (1965) found a slight reversion toward an external locus of control by males in 10th to 12th grade. Subjects scoring 12 on Rotter's Scale were dropped from the study in order to establish a cleaner difference, however, in this study the young internal subjects were still closer to that middle score than the elderly sample (8.55 to 6.55 respectively); and the mean for the total high school sample was closer to that middle score than Rotter's high school student norms (11.45 to 8.58 respectively). It is difficult to know whether these subjects will become more

external or internal in later adult years and what factors beside one's locus of control are contributing. The overall findings may have been biased if in fact some of the borderline subjects were only temporarily external or internal due to the confounding factors of adolescence.

Secondly, a lack of significant results may be due to the lack of a good comparison group of elderly external subjects. The fact that an external elderly sample was not found created some difficulties but in reviewing the literature it was not surprising that only internal subjects volunteered to be a part of the study. Internals engage in more achievement-oriented behaviors and are generally more interested in improving their situation in life. They seek information that allows them to assess their situation whether or not the feedback is positive or negative. If we accept the idea that most elderly individuals believe the stereotype of cognitive decline with age, it is less likely that external individuals would volunteer for a study involving cognitive tests. Internals, on the other hand, would be willing to participate even if they expected not to do well.

A third problem involved the presentation of the positive/negative feedback before subjects completed the cognitive tasks. The purpose of the feedback was to

reinforce or violate social stereotypes and labels to see if the labels had an effect on cognitive performance or more importantly on the subjects' expectations of success or failure. Orginally this pretest information was intended to be more forceful in order to maximize the effect. The ethics committee, however, was concerned that I not be that forceful which in turn meant that I had to weaken the impact of the feedback given. The elderly sample was composed of exceptionally strong internals, and yet the feedback was effective to some degree on metacognition scores since there was still a main effect for feedback, particularly the negative feedback. However, the feedback may not have been strong enough with such a biased sample to affect actual cognitive performance.

Chapter VIII

Implications and Conclusions

The author's purpose for conducting this study was to examine the effects of negative stereotypes concerning cognitive performance in old age on elderly individual's metacognition skills and their actual cognitive performance. Elderly subjects were compared to a younger sample to test the influence of negative feedback. Positive or negative feedback pertaining to how well subjects of a similar age group generally perform on cognitive tasks was given to the various groups before they completed a series of comprehension tests. For the elderly, the purpose of the feedback served to stimulate the influence of socially-learned stereotypes. The concept of locus of control was utilized to distinguish individuals who characteristically adapt well to the aging process, are generally satisfied with their lives and in many ways deny the negative stereotypes about old age (internal elderly) from those who do not (external elderly). Twenty elderly internals, 20 internal high school students and 20 external high school students each completed metacognition tests and accompanying comprehension tests. While no significant results were

found on the original sample, a post hoc analysis in which elderly and young subjects were matched on internal scores and compared to a highly external group, indicated certain trends.

The elderly internals' metacognition scores were influenced by feedback in a similar way to that of young externals. Those given positive feedback estimated their performance scores higher than those given negative feedback. Young internals, on the other hand, were dramatically influenced in the opposite direction. Those given positive feedback estimated their performance scores lower than those given negative feedback. The trend suggests that negative feedback is what differentiates the three groups. Actual cognitive test performance was not affected by feedback, age or locus of control.

Such results have certain implications about the powerful influence that negative attitudes and stereotypes may have on elderly individuals. Research suggests that elderly individuals with an internal locus of control orientation have a certain advantage over their externally oriented peers (Rodin, 1980). Internals are more likely to feel satisfied and to adapt more easily to the aging process than externals. They feel positively about many personality characteristics linked to competent behavior.

In fact, increasing numbers of elderly people, especially internals, have positive concepts of themselves, desire continuous personal growth and are eager to find fulfillment through broader, contributory social roles (Tibbetts, 1980). These internally oriented individuals are playing an important part in undermining some of the basic stereotypes about old age; however, the persistent view and its concomitant effect that cognitive capabilities decline with age seems to remain. The evidence that internal elderly subjects are influenced by feedback, especially negative feedback, concerning their cognitive performance suggests that elderly people may anticipate reduced competence since that is the prevailing social stereotype. Although the elderly sample for this study was biased, it was biased against these findings. The sample was extremely internally oriented, healthy and active. If this sample is negatively influenced by negative stereotypes one might reasonably expect the average elderly individual to be even more influenced by the negative stereotypes of old age.

The present study further supports Blau's (1973) hypothesis that the loss of significant roles, including isolation from various occupations, educational and social experiences, is likely to contribute to lowered performance levels or at least the expectations of lowered

performance levels. The environment of the elderly is characterized as being intellectually impoverished. The withdrawal of appropriate reinforcements or sanctions and the active discouragement of competence-related behaviors are a reflection of societal expectations. The data from this study supports Labouvie-Vief's (1973) argument that at least part of the decrement in memory/learning abilities among the aged may be accounted for by the restricting influences of a non-supportive environment. Until negative attitudes, stereotypes, and the lack of opportunities for personal growth are critically assessed, the majority of aged individuals will not realize their cognitive potential and society will continue to neglect a valuable resource.

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Appendix A

Cover Letter

Demographic Questionnaire

FACULTY OF HOME ECONOMICS

THE UNIVERSITY OF ALBERTA · EDMONTON, CANADA · T6G 2M8

403 · 432·3824

I am contacting you at this time to find out if you might be interested in taking part in a study that I am conducting at the University of Alberta.

I am studying how people of differing ages learn various types of material. You will be asked to read or listen to certain pieces of information. Then you may be asked to answer questions on paper or verbally, about this material. The whole study should take less than two hours of your time including any breaks. During this activity you may decide to stop at any time.

While there probably will be no direct benefit to you from taking part in these studies, I would be most appreciative of your participation. I am interested in talking with people with a wide range of backgrounds to help me understand the many things that might influence learning.

If you would like to take part in such a study, please fill out the following short questionnaire and return it to myself or my assistant (Gretchen Brundin). Completing the questionnaire and returning it only indicates you might be interested in taking part in this study. You have in no way committed yourself.

Please feel free to contact me at 432-4191 or Gretchen Brundin at 433-2320 should you have any questions.

Yours sincerely,

Nancy L. Hurlbut, Ph.D.,
Assistant Professor,
Department of Family Studies,
801 General Services Building.

Demographic Questionnaire

Name: _____

Address: _____

Birthdate: _____ day _____ month _____ year

Place of Birth: _____ city _____ province _____ country

Phone number: _____

Sex: _____male _____female

Marital stutus: _____single _____married

_____widow/widower

We would like to know a little bit more about you.

1. What is your present work status (include housewife)?
   _____ retired. What was your job at time of retirement? _____
   _____working part-time. What is/are your present job (s) _____
   _____working full time. What is your present job? _____

2. What is your spouse's present work status (include housewife)?
   _____retired. What was his/her job at time of retirement? _____
   _____working part-time. What is his/her present job(s)? _____
   _____full-time work.What is his/her present job? _____
   _____The question does not apply to me.

3. How much schooling did you have the opportunity to complete?
   _____number of years. If you had the chance to receive a certificate or degree, what is it? _____

4. How many years have you lived in Canada? _____years
   in Alberta _____years
   in your present residence? ____years

5. How many people live with you in your present household? _____

6. What relationship do you have with the people with whom you live? For example: live alone, husband, daughter, nephew, friend).
   _____

7. Do you have any ongoing or recurring health conditions?
   _____yes _____no If yes, which ones are they? _____
   _____

8. Do you regularly take any medicine or pills?
_____yes _____no If yes, which ones are they? _____
_____

9. Would you be able to come to the University of Alberta by yourself to participate in this study? _____

10. What time of day do you prefer to be contacted?
_____ morning _____evening
_____ afternoon _____anytime

Someone may contact you at a later date about the possibility of your participation in a study. Thank you very much for your time.

Nancy L. Hurlbut, Ph.D.,
Assistant Professor,
Department of Family Studies,
801 General Services Building.
Phone: 432-4191

Appendix B

Cover Letter

Rotter's Internal-External Control Scale

FACULTY OF HOME ECONOMICS

THE UNIVERSITY OF ALBERTA • EDMONTON, CANADA • T6G 2M8

403 • 432-3824

In the Spring you responded to a questionnaire asking if you were interested in taking part in a study at the University of Alberta.

We are expanding the initial study and need a little more information. If you are still interested in taking part in a learning study, please fill out the enclosed questionnaire according to the instructions and send it back as quickly as possible. You will be contacted in August or September by one of my assistants, Jennifer Rodgers or Gretchen Brundin, about setting up a date to meet with her at the University.

All responses will be held in confidence and individual scores will not be made available to you or anyone but myself or one of my assistants.

Returning this questionnaire only indicates you might still be interested in taking part in this study. You have in no way committed yourself. Please feel free to contact me at 432-4191 or Jennifer Rodgers at 432-5141.

Thank you for your time.

Yours sincerely,

Nancy L. Hurlbut, Ph.D.
Assistant Professor
Department of Family Studies
801 General Services Building

Name: _____

Directions: Please read the following pairs of statements. Select the one statement (A or B) from each set that you more strongly believe to be true. Some of the pairs are difficult to choose between. Even if you do not completely agree with either statement, please make a choice. There are no right or wrong answers. Each item should be chosen independently and not influenced by previous answers or by someone else's opinion. Do not spend too much time on any one pair, do not work with anyone else and do not discuss your choices with anyone else.

Circle your choice (A or B) for each of the following pairs.

1. A. Children get into trouble because their parents punish them too much.

   B. The trouble with most children nowadays is that their parents are too easy with them.

2. A. Many of the unhappy things in people's lives are partly due to bad luck.

   B. People's misfortunes result from the mistakes they make.

3. A. One of the major reasons why we have wars is because people don't take enough interest in politics.

   B. There will always be wars, no matter how hard people try to prevent them.

4. A. In the long run people get the respect they deserve in this world.

   B. Unfortunately, an individual's worth often passes unrecognized in this world.

5. A. The idea that teachers are unfair to students is nonsense.

   B. Most students don't realise the extent to which their grades are influenced by accidental happenings.

6. A. Without the right breaks one cannot be an effective leader.

   B. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. A. No matter how hard you try some people just don't like you.

   B. People who can't get others to like them don't understand how to get along with others.

8. A. Heredity plays the major role in determining one's personality.

   B. It is one's experiences in life which determine what they're like.

(2)

9. A. I have often found that what is going to happen will happen.

   B. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. A. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.

   B. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. A. Becoming a success is a matter of hard work, luck has little or nothing to do with it.

   B. Getting a good job depends mainly on being in the right place at the right time.

12. A. The average citizen can have an influence in government decisions.

   B. This world is run by the few people in power, and there is not much the little guy can do about it.

13. A. When I make plans, I am almost certain that I can make them work.

   B. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. A. There are certain people who are just no good.

   B. There is some good in everybody.

15. A. In my case getting what I want has little or nothing to do with luck.

   B. Many times we might just as well decide what to do by flipping a coin.

16. A. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

   B. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. A. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

   B. By taking an active part in political and social affairs the people can control world events.

18. A. Most people don't realize the extent to which their lives are controlled by accidental happenings.

   B. There really is no such thing as "luck".

(3)

19. A. One should always be willing to admit mistakes.

    B. It is usually best to cover up one's mistakes.

20. A. It is hard to know whether or not a person really likes you.

    B. How many friends you have depends upon how nice a person you are.

21. A. In the long run the bad things that happen to us are balanced by the good.

    B. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. A. With enough effort we can wipe out political corruption.

    B. It is difficult for people to have much control over the things politicians do in office.

23. A. Sometimes I can't understand how teachers arrive at the grades they give.

    B. There is a direct connection between how hard I study and the grades I get.

24. A. A good leader expects people to decide for themselves what they should do.

    B. A good leader makes it clear to everybody what their jobs are.

25. A. Many times I feel that I have little influence over the things that happen to me.

    B. It is impossible for me to believe that chance or luck plays an important role in my life.

26. A. People are lonely because they don't try to be friendly.

    B. There's not much use in trying too hard to please people, if they like you, they like you.

27. A. There is too much emphasis on athletics in high school.

    B. Team sports are an excellent way to build character.

28. A. What happens to me is my own doing.

    B. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. A. Most of the time I can't understand why politicians behave the way they do.

    B. In the long run the people are responsible for bad government on a national as well as on a local level.

Appendix C

Script for Instructions

Informed Consent

Instructions

Introduction to Ss Pool Information

Good Morning, I'm Jennifer Rodgers, one of Dr. Nancy Hurlbut's graduate students. Thank you for filling out the earlier questionnaire. The purpose of having you come today is to have you do three learning tasks in order to help us gain an understanding of how learning strategies change with age. If there are any questions about the purpose of the study, I would prefer to answer them after you have completed the learning tasks. Are there questions about anything else? (Put subjects at ease if they appear anxious.) If there are no questions would you read and sign the Informed Consent please? (Everyone understood the nature of the study and agreed to participate.) Now we can begin.

Basic Understanding of the Task

There are three different essays I would like you to read and answer questions on. We will wait until everyone in the group is finished with one exercise before going on to the next. I will carefully go over the instructions for each exercise before asking you to read the essay and answer the questions.

Specific Group Instructions

Positive Feedback Group. The three essays are not very difficult. Most subjects your age generally do very well on these learning tasks. Work at your own speed. I am sure you will do very well.

Negative Feedback Group. The three essays are quite difficult. Most subjects your age do not do very well on the questions but I want you to try to do them as best as you are able. No one else will see your score except Dr. Hurlbut and myself.

Specific Task Instructions

Task 1. Here is the first essay. It is about product labels-products such as food, drugs, and cosmetics. You can read the essay at your own speed but when you are finished I will collect the essay

and give you a sheet with 10 multiple-choice questions to answer. Pay attention to details because you will not be able to refer to the essay while answering the questions. Are there any questions? (All Ss apparently understood the nature of the task.)

Before you begin to read the essay I would like you to do one other thing. Estimate how well you think you will do by answering the three questions on this answer sheet. I will collect the answer sheets when you are finished but you will have a chance after completing the task to again estimate how well you think you did. (Answer sheets are collected.)

Here is the first essay. Read it at a comfortable speed. Raise your hand when you are finished. I will collect the essay and give you a copy of the multiple-choice questions. Please circle all your answers on the question sheet.

Now that everyone is finished check to see that you answered the final question- How many answers do you think you actually got correct on this test?

Task 2. Here is the second exercise. The information you need is provided in a graph which represents hypothetical expenditures by a Provincial government during the Fiscal Years of 1929 to 1940. You will be asked to interpret the information provided in the graph. Use only the information provided, not information you may have obtained through experience. The amount of expenditure for any given year is read from the base line, up to the point in question. For example, the expenditure for highways in 1930 was 60 million dollars. Are there any questions on how to read the graph? On the second page is a list of 10 statements. Using the information provided in the graph, decide whether a statement is (A) definitely true, (B) probably true, (C) definitely false (D) probably false or (E)not sufficient to indicate any degree of truth or falsity. Write the corresponding letter which describes the statement on the line in front of each statement. Are there any questions?

(3)

Before you begin will you please estimate how well you think you will do on this particular task? Answer the three questions on this sheet and turn it in to me before you begin the task. You will be given a chance to reassess how well you did at the end of the task.

Task 3. Here is the third and final task. You are asked to read the following essay which provides information about baseball players applications for unemployment compensation during the off-season. You are going to be asked to make a decision about whether or not they should be allowed to collect unemployment insurance. Whatever you decide is your own opinion and is neither judged right nor wrong. Based on your decision, however, you are to decide which of five statements (x) support the logic of your decision, (y) do not support the logic of your decision or (z) you are unable to decide whether or not they support your decision. Are there any questions?

Before you begin please estimate you well you think you will do on this task. Again answer the three questions on this answer sheet and hand it into me before you begin the task. At the end of the task you can estimate how well you think you did.

Post-Experiment Debriefing

I am sure you all did very well. Thank you for helping me and let me explain the purpose of the information I gave you before you began the three learning tasks. Some of the groups I meet with I explain that the tasks are difficult and that most people their age do not do very well. Other groups are told that the tasks are very easy and that people their age do very well. What I didn't explain was that the purpose of this experiment was to investigate the effect of positive and negative feedback on elderly subject's assessment of their cognitive performance. The negative feedback was used to represent or reinforce the negative stereotypes about declining cognitive abilities with age. What are your own feelings

(4)

about memory/learning abilities at your age. (Informal discussion then takes place if the subjects have time.) Are there any other comments or questions?

Thank you again for your time. Your participation in this study has been very helpful and I certainly enjoyed talking with all of you.

Informed Consent

The purpose of this study is to examine the effect of age on people's performance on a variety of tests which require learning skills. You will be asked to respond as accurately as possible. There is no risk in any of these tasks, but if you feel tired, tell me and we will stop for a rest. The whole study will take less than one and a half hours. You may withdraw from the experiment at any time.

I will be happy to explain specific purposes of the study, but would prefer to wait until it is finished, so that we do not influence the way in which you respond. While there is probably no direct benefit to you from taking part in these experiments, by obtaining a better understanding of learning skills, we hope that this work may contribute to future attempts to understand the many things that might influence memory.

Signature: _____ Date: _____

Appendix D

Comprehension and Metacognition Tests

Learning Trial #1

Please read the following essay on product labels. Pay attention to details. You will be asked to answer ten multiple-choice questions concerning the information in the article. You will not be allowed to look back at the article once you have finished the reading.

PRODUCT LABELS

Every word on a label describing a food, a drug, a cosmetic, or a medical device is important in protecting you and your family from buying an inferior product, from misusing a good one, from being tricked by dangerous quackery, or from unknowingly possessing an item harmful to health.

First of all, the label on a can or package of food must be completely truthful. If a loaf of bread is made with soy flour, the loaf cannot be labeled as white bread.

A label must not be misleading. This restriction is somewhat vague and therefore cannot prevent all violations. Although the government tries to eliminate all misleading labels, the consumer must nevertheless be always on guard. Just because a can of sardines has a fancy-sounding foreign name, don't take for granted that the fish were imported. It is the law, too, that manufacturers must list their names and places of business on their labels.

Manufacturers must use common names in identifying their products so that anyone can readily understand what he is buying. Synthetic foods must be prominently labeled as artificial. Foods composed of two or more ingredients must bear labels listing all ingredients in the order of predominance.

(2)

Please answer the following multiple-choice questions in reference to the essay you just read. Circle your answers on this page.

1. According to the article, the main purpose of a label is to
   A. attract the consumer
   B. protect the consumer
   C. list the ingredients
   D. protect the manufacturer
2. Careful reading of the label will prevent
   A. misuse of a product
   B. buying an inferior product
   C. buying a harmful substance
   D. A, B, and C.
3. A loaf of bread made with soy flour
   A. is not good bread
   B. must be labeled as white bread
   C. is harmful to health
   D. must not be labeled as white bread
4. The author suggests that
   A. some labels are misleading in spite of government inspection
   B. all labels are misleading
   C. most labels are vague
   D. the government does nothing about misleading labels
5. A foreign name on a label
   A. is never misleading
   B. always indicates that the product is an import
   C. may lead one to believe that the product is an import
   D. is never completely truthful
6. Products are to be identified by
   A. technical terms
   B. foreign terms
   C. common names
   D. unusual names

(3)

7. The most important ingredient in a product must be listed
   A. first
   B. last
   C. in the middle
   D. as artificial
8. Implied but not stated:
   A. At one time, some labels were deliberately misleading.
   B. Every word on a label is important.
   C. Synthetic foods are superior products.
   D. Foreign foods always have misleading labels.
9. The following information must be listed on the labels by the manufacturer.
   A. manufacturers name and place of business.
   B. manufacturers marketing number
   C. none of the above
   D. A and B
10. Synthetic foods must be labeled
   A. health foods
   B. potentially dangerous to your health
   C. artificial
   D. foreign products

Now that you have completed the task do you think you did better or worse than you anticipated? _____ How many questions do you think you answered correctly? _____

Learning Task #1

1. How many questions out of 10 do you think you will answer correctly on this task? _____

2. Compared to other individuals your age, how well do you think you will do?

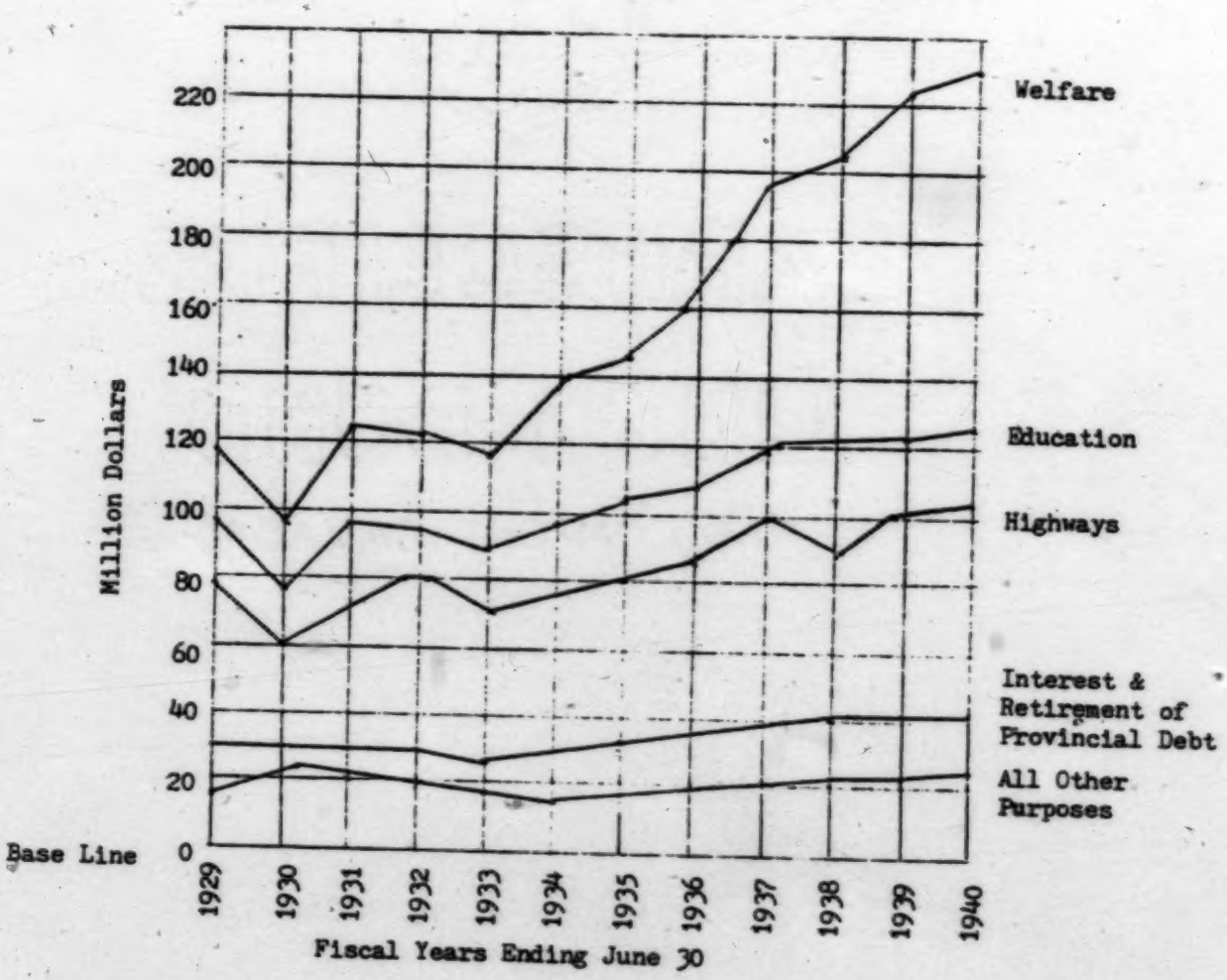
   much better better average worse much worse

3. Compared to high school students how well do you think you will do?

   much better better average worse much worse

Learning Trial #2

The following graph represents hypothetical expenditures by a Provincial government during the Fiscal Years of 1929 to 1940. You will be asked to interpret the information provided in the chart. Use only the information provided, not information you may have obtained through experience. The amount of expenditure for any given year is read from the base line, up to the point in question. For example, the expenditure for highways in 1930 was 60 million dollars.



(2)

Choose one of the following explanations (A, B, C, D, or E) which best corresponds with each of the statements below. Decide if the information in the chart is sufficient for a judgment that the statement is:

A) definitely true

B) probably true

C) definitely false

D) probably false

E) Not sufficient to indicate any degree of truth or falsity

Statements:

_____ 1. Less money was spent in 1930 than before 1929 for welfare and education.

_____ 2. Less money was spent for highways in 1931 than in 1932.

_____ 3. The Provincial debt increased little between 1933 and 1940 as compared to expenditures for education.

_____ 4. Unemployment increased between 1937 and 1939.

_____ 5. The total expenditures in 1940 exceeded one-half billion dollars.

_____ 6. Increase in expenditures from 1929 to 1940 has been the least in those classified interest and retirement of Provincial debt.

_____ 7. The per capita expenditures of cities for welfare and for education parallel the expenditures for these two purposes.

_____ 8. Less money was spent by the Province in 1930 than in 1929 because of retrenchment with respect to highway expenditure.

_____ 9. The increasing amount of money spent by the Province for all other purposes between 1929 and 1940 must have come from sources other than borrowing.

_____10. In 1940 a much greater proportion of the total expenditures were for welfare than in 1942.

Now that you have completed the task do you think you did better or worse than you anticipated?

How many questions do you think you answered correctly? _____

Learning Task #2

1. How many questions out of 10 do you think you will answer correctly on this task? _____

2. Compared to other individuals your age, how well do you think you will do?

   much better better average worse much worse

3. Compared to high school students how well do you think you will do?

   much better better average worse much worse

Learning Trial #3

Please read the following problem. After reading the problem you will read three possible conclusions. Determine which of the three conclusions you think is most logical..

Social Insurance officials sometimes face perplexing problems in studying appeals for unemployment compensation. Some major-league baseball players decided in January that, because they had not played ball since the end of the season, they had a right to consider themselves unemployed. Although they were earning good salaries, they maintained that they were entitled to the benefits of the unemployment section of the Social Insurance Act.

Team owners urged these players not to apply for unemployment compensation. According to the owners' interpretation, the players were under contract all year around, although they worked and were paid only during the playing season. On the other hand, the government officials were inclined to agree with the players that they were entitled to benefit payments

Now, examine the three conclusions given below. Assuming that the above paragraphs give a fair statement of the problem, which one of the conclusions do you think is most justified? Circle the letter in front of your choice.

Conclusions:

A) The players were entitled to the benefits of the unemployment section of the Social Insurance Act.

B) The players were not entitled to the benefits of the unemployment section of the Social Insurance Act.

C) More information is needed to decide whether or not the players were entitled to the benefits of the unemployment section of the Social Insurance Act.

(2)

Keeping in mind the conclusion you have choosen, match the following two columns. Write the letter x, y, or z next to each of the five statements on the right-hand side which best explains the relationship of your conclusion to the statement.

x) Statements which support the logic of your conclusion.

y) Statements which do not support the logic of your conclusion.

z) Statements about which you are unable to decide whether or not they support your conclusion.

_____1) Because government officials are the ones who consider appeals for unemployment compensation, their opinion carries more weight than the opinions of team owners.

_____2) It is not clear whether or not the Social Insurance Act states that a man who works and receives pay during part of the year is unemployed during the remaining part of the year.

_____3) The players argued that if others receive compensation, why shouldn't they. They forget that others may need it more than they.

_____4) A clearer definition of unemployment may lead to a changed conclusion even though the argument from each definition is logical.

_____5)No one who earns an average or above average annual salary should get unemployment compensation.

Now that you have completed the task do you think you did better or worse than you anticipated? _____

How many questions do you think you answered correctly? _____

Learning Task #3

1. How many questions out of 5 do you think you will answer correctly on this task? _____
2. Compared to other individuals your age, how well do you think you will do?

   much better better average worse much worse

3. Compared to high school students how well do you think you will do?

   much better better average worse much worse

Appendix E

Analysis of Variance: Source Tables for Total Sample

Table A

Analysis of Variance: Metacognition Scores
(Overall Analysis)

Source	SS	DF	MS	F	P
Groups	30.10	2	15.05	0.86	0.43
Feedback	74.82	1	74.82	4.28	0.04
Group X Feedback	24.63	2	12.32	0.70	0.50
Error	944.10	54	17.48		

Table B

Analysis of Variance: Cognitive Scores
(Overall Analysis)

Source	SS	DF	MS	F	P
Groups	5.23	2	2.62	0.29	0.75
Feedback	3.75	1	3.75	0.42	0.52
Group X Feedback	23.70	2	11.85	1.32	0.28
Error	483.50	54	8.95		

Table C

Analysis of Variance: Metacognition Scores
(For Internal Subjects)

Source	SS	DF	MS	F	P
Age	3.03	1	3.03	0.17	0.68
Feedback	18.23	1	18.23	1.02	0.32
Age X Feedback	1.23	1	1.23	0.07	0.80
Error	642.30	36	17.84		

Table D

Analysis of Variance: Metacognition Scores
(For Young Subjects)

Source	SS	DF	MS	F	P
LC	28.90	1	28.90	1.83	0.18
Feedback	62.50	1	62.50	3.96	0.05
LC X Feedback	22.50	1	22.50	1.43	0.24
Error	567.60	36	15.77		

Table E

Analysis of Variance: Metacognition Scores
(For Young Externals/Elderly Internals)

Source	SS	DF	MS	F	P
Age	13.23	1	13.23	0.70	0.41
Feedback	81.23	1	81.23	4.31	0.05
Age X Feedback	13.23	1	13.23	0.70	0.41
Error	678.30	36	18.84		

Table F

Analysis of Variance: Cognitive Scores
(For Internal Subjects)

Source	SS	DF	MS	F	P
Age	0.03	1	0.03	0.003	0.96
Feedback	13.23	1	13.23	1.53	0.22
Age X Feedback	11.03	1	11.03	1.27	0.27
Error	311.50	36	8.65		

Table G

Analysis of Variance: Cognitive Scores
(For Young Subjects)

Source	SS	DF	MS	F	P
LC	4.23	1	4.23	0.50	0.49
Feedback	1.23	1	1.03	0.15	0.71
LC X Feedback	2.03	1	2.03	0.24	0.63
Error	304.90	36	8.47		

Table H

Analysis of Variance: Cognitive Scores
(For Young Externals/Elderly Internals)

Source	SS	DF	MS	F	P
Age	3.60	1	3.60	0.37	0.55
Feedback	4.90	1	4.90	0.50	0.48
Age X Feedback	22.50	1	22.50	2.31	0.14
Error	350.60	36	9.74		

Appendix F

Analysis of Variance: Source Table for Partial Sample

Table I

Analysis of Variance: Metacognition Scores
(Overall Analysis)

Source	SS	DF	MS	F	P
Groups	41.27	2	20.63	1.96	0.16
Feedback	28.03	1	28.03	2.67	0.12
Groups X Feedback	76.47	1	38.23	3.64	0.04
Error	252.40	24	10.52		

Table J

Analysis of Variance: Cognitive Scores
(Overall Analysis)

Source	SS	DF	MS	F	P
Groups	6.07	2	3.03	0.42	0.66
Feedback	0.03	1	0.03	0.01	0.95
Groups X Feedback	5.27	2	2.63	0.37	0.70
Error	172.80	24	7.20		

Table K

Analysis of Variance: Metacognition Scores
(For Internal Subjects)

Source	SS	DF	MS	F	P
Age	24.20	1	24.20	1.94	0.18
Feedback	9.80	1	9.80	0.78	0.39
Age X Feedback	72.20	1	72.20	5.78	0.03
Error	200.00	16	12.50		

Table L

Analysis of Variance: Metacognition Scores
(For Young Subjects)

Source	SS	DF	MS	F	P
LC	36.45	1	36.45	3.40	0.08
Feedback	0.45	1	0.45	0.04	0.84
LC X Feedback	36.45	1	36.45	3.40	0.84
Error	171.60	16	10.73		

Table M

Analysis of Variance: Metacognition Scores
(For Young Externals/Elderly Internals)

Source	SS	DF	MS	F	P
Age	1.25	1	1.25	0.15	0.70
Feedback	84.05	1	84.05	10.10	0.01
Age X Feedback	6.05	1	6.05	0.73	0.41
Error	133.20	16	8.33		

Table N

Analysis of Variance: Cognitive Scores
(For Internal Subjects)

Source	SS	DF	MS	F	P
Age	5.00	1	5.00	0.66	0.43
Feedback	0.20	1	0.20	0.03	0.87
Age X Feedback	5.00	1	5.00	0.66	0.43
Error	122.00	16	7.63		

Table O

Analysis of Variance: Cognitive Scores
(For Young Subjects)

Source	SS	DF	MS	F	P
LC	4.05	1	4.05	0.49	0.50
Feedback	1.25	1	1.25	0.15	0.70
LC X Feedback	0.45	1	0.45	0.05	0.82
Error	132.80	16	8.30		

Table P

Analysis of Variance: Cognitive Scores
(For Young Externals/Elderly Internals)

Source	SS	DF	MS	F	P
Age	0.05	1	0.05	0.12	0.89
Feedback	1.25	1	1.25	0.22	0.66
Age X Feedback	2.45	1	2.45	0.43	0.52
Error	90.80	16	5.68		